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Customer No. 22,852
Attorney Docket No. 3804.1596

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	
	)	
Manfred BOHN et al.	)	Group Art Unit: 1614
	)	
Application No.: 09/077,194	)	Examiner: V. Kim
	)	
Filed: May 26, 1998	)	
	)	
For: USE OF 1-HYDROXY-2-PYRIDONES FOR THE TREATMENT OF SEBORRHEIC DERMATITIS	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

SUBMISSION OF ENGLISH TRANSLATION OF FR 2 618 068

Appellants submit herewith an English-language translation of French patent application no. FR 2 618 068.

REMARKS

The French application and English-language abstract corresponding to the enclosed translation already have been considered by the Examiner. *See* Information Disclosure Statement and PTO 1449 form dated July 23, 2001 (initialed by Examiner). The translation has recently become available to Appellants, because it was prepared in response to the Final Office Action dated April 2, 2003, in U.S. Application No. 09/068,894. Since the translation is now available, Appellants provide it to the Office.

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Respectfully submitted,

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Dated: June 9, 2003

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CERTIFICATE OF ACCURACY

STATE OF Pennsylvania
COUNTY OF Allegheny

Warren T. McClurg deposes and says that the attached English translation of a copy of the original French document of (copy attached):

Patent 2 618 068

is a true and complete translation to the best of my knowledge and belief.

Director

Sworn to and subscribed before me on this 4th day of June 2003.

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18 FRANCE

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12 **PATENT APPLICATION** **A1**

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60 References to other related national documents:

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54 Composition Based on Derivatives of Hydroxypyridone to Diminish Hair Loss

57 Composition based on derivatives of Hydroxypyridone to diminish hair loss. Composition to diminish hair loss contains at least one compound having the formula:

See original

where:
R_1 denotes hydrogen, alkyl, cycloalkyl, cycloalkyl-alkylene;
R_2 denotes hydrogen, alkyl, alkenyl, halogen or benzyl;
R_3 denotes hydrogen, alkyl or phenyl;
R_4 denotes hydrogen, alkyl, alkenyl, methoxymethyl, halogen or benzyl.

Composition Based on Derivatives of Hydroxypyridone to Diminish Hair Loss.

The invention relates to compositions to diminish hair loss based on derivatives of hydroxypyridone

It has been known for a longtime to those skilled in the art that natural hair loss in men, reflects an overall hair follicle equilibrium between the alternate phases of growing (anagene) and falling out (telogen). The average ratio of the number follicles in the anagene phase to that in the telogen phase is of the order of 9 (90/10). The percentage of follicles in the at rest phase (catagen) appears to be very low.

The natural loss of hair can be estimated, on the average, at several hundred hairs per day for a normal physiological state.

It is known, moreover, that certain factors such as hormonal imbalance, physiological stress, malnutrition, can accentuate the phenomenon.

:In certain characteristically inflammatory dermatoses of the scalp such as for example psoriasis, or dysseborrhoeic dermatitis, hair loss can be greatly increased or bring about greatly disturbed follicle cycles.

The hydroxypyridone derivatives are known already. Among the most representative compounds, one may mention the ciclopirox or 6-cyclohexyl 1-hydroxy 4-methyl, 2-(1H)-pyridone known as an antifungal agent and octopirox, or also the 1-hydroxy 4- methyl 6-(2,4,4-trimethylpentyl)-2-(1H)-pyridone known for its antipellicular properties.

Surprisingly, the applicant has now discovered that the utilization of these derivatives allows one to diminish hair loss.

According to one particularly preferred embodiment, it has been established that, whether or not associated with anti-inflammatory steroids such as, in particular, hydrocortisone, indomethacin, glycyrrhetinic acid, 1'α-bisabolol, betamethasone, fluoronilone acetonide, desoxymethasone, permits further enhancement of this effect.

The object of the invention is thus a new composition based on hydroxy pyridone for diminishing hair loss.

A further object of the invention consists of their application to treatment of the hair, and the scalp.

Other objects of the invention will be apparent upon reading the description and the examples that follow.

The composition conforming to the invention is essentially characterized by the fact that it contains, in an appropriate medium for topical treatment, at least one compound corresponding to formula (I).

see original (I)

where,

R_1 denotes a hydrogen atom, a linear or branched alkyl group, having 1 to 17 carbon atoms, cycloalkyls having 5 to 8 carbon atoms, cycloalkyl-alkylene, an alkylene group having 1 to 4 carbon atoms, aryl, aralkyl, an alkyl group having 1 to 4 carbon atoms, aryl-alkenyl, the alkenyl group having 2 to 4 carbon atoms, the cycloalkyl and aryl groups capable of being substituted by an alkyl group having 1 to 4 carbon atoms, as well as an alkoxy group having 1 to 4 carbon atoms.

R_2 denotes hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, a halogen atom or a benzyl group.

R_3 denotes hydrogen, alkyl having 1 to 4 carbon atoms or phenyl, and

R_4 denotes hydrogen, alkyl having 1 to 4 carbon atoms, alkenyls having 2 to 4 carbon atoms, methoxymethyl or a halogen atom or a benzyl group such that their salts are cosmetically or pharmaceutically acceptable.

Among these compounds, those that are particularly preferred are the 1-hydroxy 4-methyl 6-(2,4,4-trimethylpentyl) 2-(1H)-pyridone and the 6-cyclohexyl 1-hydroxy 4-methyl 2-(1H)-pyridone.

Among the utilizable salts one may cite the lower alkanolamine salts such as ethanolamine, diethanolamine, amine or alkylamine salts, quaternary ammonium salts as well as salts with inorganic cations, alkaline, ammonium and alkaline earth salts.

Compositions conforming to the invention contain according to a particularly preferred embodiment, in association with the pyridones defined above, steroid anti-inflammatory agents such as more particularly, hydrocortisone, indomethacin, glycyrrhetinic acid, 1' α-bisabolol, betamethasone, fluorinolone acetonide, desoxymethasone, etc.

In another preferred form of the invention, the composition additionally contains antibacterial agents selected in particular from antibiotics of the macrolide family and more particularly erythromycin and its derivatives, the pyranosides such as linomycin and its derivatives and clindamycin and its derivatives.

Among the erythromycin derivatives, one may cite in particular erythromycin itself and its derivatives, such as the estolate, the ethyl carbonate, the ethyl succinate, the glucoheptonate, the lactobinate, the propionyl lauryl sulfate, the propionate, the stearate, the linoleate, the mono-enic esters such as the mono-oleate of erythromycin A. Among the derivatives of clindamycin, one may additionally cite clindamycin itself, the hydrochloride, the palmitate, and the phosphate. Among linomycin derivatives, one may cite the hydrochloride and linomycin itself.

Other utilizable derivatives within the scope of the invention are the retinoates of these antibiotics and in particular the a11-trans and 13-cis retinoic acid esters of erythromycin and clindamycin and their pharmaceutically acceptable salts such as described in particular in the applicant's French patent application No. 86.06528. The retinoic esters in position 2 'of erythromycin are represented in particular by the formula:

see original

where R denotes the 11-trans or the 13-cis retinyl group, and R' denotes H, the retinyl group having the formula:

see original (III)

The retinoic esters in position 3 of linomycin and clindamycin may be represented by the formulas:

see original *see original*

(IV) (V)

where R has the same meaning as above.

These different retinoic esters may be prepared by different esterification processes and preferably in an anhydrous organic solvent, in particular in trahydrofuran alone or mixed with another organic solvent such as pyridine, causing an excess of carbon dioxide mixed with a11-trans or 13-cis retinoic acid (prepared in situ, for example from ethyl chloroformate and a11-trans or 13-cis acid) to react with erythromycin A, linomycin or clindamycin in the form of a base, in the presence of an organic or mineral base such as pyridine and/or sodium bicarbonate.

Another esterification procedure, in particular of linomycin and clindamycin consists of utilizing the imidazolides of retinoic acids in an anhydrous solvent like N, N-dimethylformamide, in the presence of a base like sodium or potassium tertiobutylate. According to the latter procedure, the ester in position 7 of linomycin is obtained mostly with esters in position 2, 3 or 4. In the same manner one obtains a mixture of monoesters in positions 2, 3 and 4 of clindamycin.

Other erythromycin A derivatives are represented by formula (II) described in particular in FR-A-2 582 000 in which:

R or R' denotes a linear bi- or tri-enic C_{18} acyl group having an a11-cis (Z) stereochemical configuration and the remaining R or R' denotes a hydrogen atom.

According to one preferred embodiment, R or R' represent the following groups:

Z-9, Z-12-octadecadienyl or linolyl
Z-9, Z-12, Z-15-octadecatrienyl or α-linolyl and
Z-6, Z-9, Z-12-octadecatrienyl or γ-linolenyl.

One may cite in particular l'o-linolyl-2' erythromycin A, l'o-linolyl-4" erythromycin A, and l'o-α-linolyl-4" erythromycin A.

According to the invention, the pyridones are utilized in compositions conforming to the invention in proportions between 0.01 and 5 wt % in relation to the total composition weight. Anti-inflammatory agents are utilized preferably in proportions between 0.01 and 5 wt % for hydrocortisone or indomethacin and 1'α-bisabolol, in proportions of the order of 0.001 and 0.02 wt % for the derivatives of betamethasone, fluorinolone or desoxymethasone.

The antibacterial agents, in particular clindamycin, erythromycin, linomycin or their derivatives, are preferably utilized in proportions between 0.01 and 5 wt % in particular between 0.01 and 3 wt %.

The compositions conforming to the invention can be provided in diverse forms customarily utilized in pharmacy or cosmetics for treatment of the scalp.

They can be provided more particularly in the form of lotions, shampoos, mousses, creams, gels, sticks, spray, baumes, powders, stick or liquid soap. When the composition is liquid it can include an aqueous component or a mixture of water and acceptable physiologically acceptable organic solvents.. Among solvents, one can mention the lower alcohols such as ethanol, isopropyl alcohol, acetone, ethylene glycol, monomethyl, monoethyl or monobutyl ethers of ethylene glycol, propylene glycol, monoethyl ethers of propylene glycol and dipropylene glycol, alkyl esters of short chain C_{1-4} acids and ethers of polytetrahydrofuran.

These compositions can contain thickening agents such as cellulose or cellulose derivatives such as heterobiopolysaccharides like xanthane gum, polyacrylic acids reticulated by a polyfunctional agent such as the products sold under the tradename CARBOPOL.

These compositions may also include other additives customarily utilized in cosmetics and pharmacy in particular surface-active agents, perfumes, preservatives, pH regulators, colorings, cationic anionic non-ionic or amphoteric polymers.

Another object of the invention consists of the utilization of pyridone derivatives such as defined above for preparation of pharmaceutical compounds intended for treatment of hair loss.

Finally the invention has the object of providing a cosmetic hair treatment process that consists of applying to the hair at least one of the compositions defined above, the composition essentially having an affect on the hair's appearance.

The following examples are intended to illustrate the invention without being limiting in any way.

PREPARATION EXAMPLE 1

Preparation of o-retinyl (13-cis)-2' erythromycin A

One dissolves in a flask, in an inert atmosphere, 5g (16.6 mmoles) of retinoic acid (13-cis) into 35 ml of anhydrous tetrahydrofuran; the reaction mixture is cooled to 0 °C, then 3 ml (38 mmoles) of anhydrous pyridine and 1.6 ml (16.6 mmoles) of ethyl chloroformate are added. The solution is stirred for 5 minutes and one then adds 2.5 g (30 mmoles) of sodium bicarbonate, then 4.9 g (6.7 mmoles) of erythromycin A previously dissolved in 150 ml of tetrahydrofuran. The reaction mixture is then stirred for 10 hours while allowing the temperature to rise to ambient (thin layer of silica gel chromatography; methylene chloride/methanol 10%). The solution is poured into 60 ml of water, then extracted with ethyl acetate. The organic phase is dried with magnesium sulfate under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate (7)/hexane (3) resulting in the recovery of 4.4 g (65 % yield) of pure o-retinyl (13-cis)-2'-erythromycin A.

F = 82 °C (hexane/ethyl acetate)

$[\alpha]_D^{22}$ = 17° (C = 6 mg/ml dichloromethane)

Microanalysis: $C_{57}H_{93}NO_{14}$: M = 1016.4

	C	H	N
Calculated %:	67.36	9.22	1.38
Found %:	67.48	9.32	1.38

Infrared: band at 1735 cm^{-1} (ester)
NMR of ^{13}C ($CDCl_3$, internal ref. TMS)

Negative γ effects in 1' (-2.2 ppm) and 3' (-2.1 ppm) indicate the position of the ester at 2'. The carbons $C"_{20}$ (20.94 ppm), $C"_{14}$ (117.28 ppm) and $C"_{12}$ (131.9 ppm) of the retinoic chain are in agreement with the 13-cis stereochemistry of the retinoic chain.

PREPARATION EXAMPLE 2

Preparation of o-retinyl (a11-trans)-2'-erythromycin A

One dissolves in a flask in an inert atmosphere 5g (16.6 mmoles) of retinoic acid (13-cis) into 35 ml of anhydrous tetrahydrofuran; the reaction mixture is cooled to 0 °C, then one adds 3 ml (38 mmoles) of anhydrous pyridine and 1.6 ml (16.6 mmoles) of ethyl chloroformate. The solution is stirred for 5 minutes and one adds 2.5 g (30 mmoles) of sodium bicarbonate, then 4.9 g (6.7 mmoles) of erythromycin A previously dissolved in 150 ml of tetrahydrofuran. The reaction mixture is then stirred for 10 hours while allowing the temperature to rise to ambient (thin layer of silica gel chromatography; methylene chloride/methanol 10%). The solution is poured into 60 ml of water, then extracted with ethyl acetate. The organic phase is dried with magnesium sulfate under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate (7)/hexane (3) resulting in the recovery of 4.1 g (60% yield) of pure o-retinyl (a11-trans)-2'-erythromycin A.

$[\alpha]_D^{22}$ = -65° (C = 2 mg/ml dichloromethane)
Microanalysis: $C_{57}H_{93}NO_{14}.4H_2O$: M = 1088.5

	C	H	N
Calculated %:	62,89	9.35	1.29
Found %:	62.91	8.90	1.29

NMR of ^{13}C ($CDCl_3$, internal ref. TMS)

Negative γ effects in 1' (-2 ppm) and 3' (-1.9 ppm) indicate the position of the ester at 2'. The carbons C"$_{20}$ (14.21 ppm), C"$_{14}$ (119.36 ppm) and C"$_{12}$ (135.19 ppm) are in agreement with the a11-trans stereochemistry of the retinoic chain.

PREPARATION EXAMPLE 3

Preparation of o-retinyl (a11-trans)-3-clindamycin

One dissolves in a flask in an inert atmosphere 5g (16.6 mmoles) of retinoic acid (a11-trans) into 30 ml of anhydrous tetrahydrofuran; the reaction mixture is cooled to 0 °C, then one adds 6 ml (76 mmoles) of anhydrous pyridine and 1.6 ml (16.6 mmoles) of ethyl chloroformate. The solution is stirred for 5 minutes and one adds 1.25 g (15 mmoles) of sodium bicarbonate, then 2.35 g (5.5 mmoles) of clindamycin previously dissolved in 100 ml of a mixture of tetrahydrofuran (8)/pyridine (2). The reaction mixture is then stirred for 10 hours while allowing the temperature to rise to ambient (thin layer of silica gel chromatography; methylene chloride/methanol 5%). The solution is poured into 80 ml of water, then extracted with ethyl acetate. The organic phase is dried with magnesium sulfate, filtered then concentrated under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate(5)/hexane (5) resulting in the recovery of 2.15 g (55% yield) of pure o-retinyl (a11-trans)-3-clindamycin.
F = 62 °C

$[\alpha]_D^{22}$ = +50° (C = 100 mg/ml dichloromethane)

Microanalysis: $C_{38}H_{59}N_2SO_6Cl.2.5H_2O$: M = 752.5

	C	H	N
Calculated %:	60.44	8.08	3.23
Found %:	60.66	8.57	3.72

NMR of ^{13}C ($CDCl_3$, internal ref. TMS): Negative γ effects in position 4 (-2.8 ppm). and in position 2 (-1.9 ppm). The chemical displacement of the C"$_{14}$ (117.84 ppm) and of C"$_{20}$ (14.11 ppm) confirm the (a11-trans) stereochemistry of the retinyl chain.

PREPARATION EXAMPLE 4

Preparation of o-retinyl (13-cis)-3-clindamycin

One dissolves in a flask under in an inert atmosphere 5g (16.6 mmoles) of retinoic acid (13-cis) into 30 ml of anhydrous tetrahydrofuran; the reaction mixture is cooled to 0 °C, then one adds 6 ml (76 mmoles) of anhydrous pyridine and 1.6 ml (16.6 mmoles) of ethyl chloroformate. The solution is stirred for 5 minutes and one adds 1.25 g (15 mmoles) of sodium bicarbonate, then 2.35 g (5.5 mmoles) of clindamycin previously dissolved in 100

ml of a mixture of tetrahydrofuran (8)/pyridine (2). The reaction mixture is then stirred for 10 hours while allowing the temperature to rise to ambient (thin layer of silica gel chromatography; methylene chloride/methanol 5%). The solution is poured into 80 ml of water, then extracted with ethyl acetate. The organic phase is dried with magnesium sulfate, filtered then concentrated under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate (5)/hexane (5) resulting in the recovery of 2 g (51% yield) of pure o-retinyl (13-cis)-3-clindamycin.

F = 95 °C (hexane/ethyl acetate)

$[\alpha]_D^{20}$ = +111° (C = 15 mg/ml dichloromethane)

Microanalysis: $C_{38}H_{59}ClN_2SO_6$: M = 707.4

	C	H
Calculated %:	64.52	8.41
Found %:	64.47	8.45

NMR of ^{13}C ($CDCl_3$, internal ref. TMS):

The position of the ester is indicated by the positive β effect in 3 (+1.77 ppm) and the negative γ effects in 2 (-1.4 ppm) and 4 (-2.5 ppm). The 13-cis configuration is confirmed by the C"$_{20}$ (20.93 ppm) and the C"$_{14}$ (115.94 ppm) values.

PREPARATION EXAMPLE 5

Preparation of o-retinyl (13-cis)-3-linomycin

One dissolves in a flask in an inert atmosphere 5g (16.6 mmoles) of retinoic acid (13-cis) in 30 ml of anhydrous tetrahydrofuran; the reaction mixture is cooled to 0 °C, then one adds 6 ml (76 mmoles) of anhydrous pyridine and 1.6 ml (16.6 mmoles) of ethyl chloroformate. The solution is stirred for 5 minutes and one adds 1.25 g (15 mmoles) of sodium bicarbonate, then 2.2 g (5.4 mmoles) of licomycin previously dissolved in 100 ml of a mixture of tetrahydrofuran (7)/pyridine (3). The reaction mixture is then stirred for 10 hours while allowing the temperature to rise to ambient (thin layer of silica gel chromatography; methylene chloride/methanol 10%). The solution is poured into 100 ml of water, then extracted with ethyl acetate. The organic phase is dried with magnesium sulfate, filtered then concentrated under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate(8)/hexane (2) resulting in the recovery of 1.85 g (50% yield) of pure o-retinyl (13-cis)-3-lincomycin.

F = 95 °C (hexane/ethyl acetate)

$[\alpha]_D^{20} = +103°$ (C = 7 mg/ml dichloromethane)

Microanalysis: $C_{38}H_{60}N_2SO_7.2.5H_2O$: M = 734.6

	C	H
Calculated %:	62.18	9.03
Found %:	62.33	8.64

NMR of ^{13}C ($CDCl_3$, internal ref. TMS):

The position of the ester is indicated by the positive β effect in 3 (+1.6 ppm) and the negative γ effects in position 2 (-2.4 ppm) and 4 (-1.9 ppm). The 13-cis configuration is confirmed by the $C"_{20}$ (20.98 ppm) and the $C"_{14}$ (115.83 ppm) values.

PREPARATION EXAMPLE 6

Preparation of the mixture of monoesters of o-retinyl (a11-trans)-7-3-lincomycin, o-retinyl (a11-trans)-3, lincomycin and o-retinyl (a11trans)-2 lincomycin

One dissolves in a flask in an inert atmosphere 30 g (74 mmoles) of lincomycin in 300 ml of anhydrous N,N-dimethylformamide then 830 mg (7.4 mmoles) of potassium tertiobutylate are added and it is then stirred for 90 minutes at ambient temperature. A solution of 13 g (37 mmoles) of retinyl (a11-trans)-1 imidazole is added to 150 ml of N,N-dimethylformamide and the resultant mixture is stirred at ambient temperature for 12 hours (thin layer of silica gel chromatography; methylene chloride/methanol 7.5%). The solution is then poured into 500 ml of water, and extracted with ethyl acetate. The organic phase is dried with magnesium sulfate, filtered then concentrated under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate (7)/hexane (3) resulting in the recovery of 39 g (77% yield) of a mixture of retinoic monoesters (a11-trans) of lincomycin in positions 2, 3 and 7.

NMR of ^{13}C ($CDCl_3$, internal ref. TMS)
- Negative γ effects in 8 (-2.5 ppm) and in 8 (-3.8 ppm) indicate the position of esterification of a monoester in position 7.
- A negative γ effect in position 1 (-4 ppm) indicates the monoester in position 2 and the negative γ effects in 2 (-2 ppm) and 4 (-2.6 ppm) indicate the position of the monoester in position 3. The positions of C_1 are at 95.06 ppm for the monoester in 2 and 88.45 ppm for the monoester in 7 and at 89.67 ppm for the monoester in position 3.

The configuration of the a11-trans retinoic chain is indicated for the $C"_{20}$ at 14.08 ppm a trace of isomerization is noted by the presence of a peak at 115.2 ppm ($C"_{14}$) indicating the 13-cis isomer

PREPARATION EXAMPLE 7

Preparation of the mixture of monoesters of o-retinyl (a11-trans)-2 clindamycin, o-retinyl(a11-trans)-3 clindamycin and o-retinyl(a11-trans)-4 clindamycin

One dissolves in a flask in an inert atmosphere 20 g (47 mmoles) of clindamycin into 250 ml of anhydrous N,N-dimethylformamide then 527 mg (4.7 mmoles) of potassium tertiobutylate are added to the reaction mixture that is then stirred at ambient temperature for 90 minutes. A solution of 8.250 g (23.5 mmoles) of retinyl (a11-trans)-1 imidazole is added to 150 ml of anhydrous N, N-dimethylformamide and the resultant mixture is stirred at ambient temperature for 12 hours (thin layer of silica gel chromatography; methylene chloride/methanol 5%). The solution is then poured into 500 ml of water, and extracted with ethyl acetate. The organic phase is dried with magnesium sulfate, filtered then concentrated under partial vacuum. The raw product thus obtained is chromatographed with a silica gel column (HPLC) utilizing as eluant: ethyl acetate (5)/hexane (5) resulting in the recovery of 28 g (85%) of a mixture of retinoic monoesters (a11-trans) of clindamycin in positions 2, 3 and 4.

NMR of ^{13}C ($CDCl_3$, internal ref. TMS)
- Negative γ effect in position 1 (-3 ppm) indicates the position of the ester in 2,
- Negative γ effects in position 4 (-2.8 ppm) and 2 (-1.9 ppm) indicate the monoester in position 3 and the weak negative γ effect in position 3 indicates the monoester in 4.

The positions of C_1 are at 84.63 ppm for the monoester in 2, at 8.79 ppm for the monoester in 3 and at 87.98 ppm for the monoester in 4.

The a11-trans configuration of the retinoic chain is in the majority (C"14 at 117.5 ppm and C"20 a 14.08 ppm, but there are clear traces of isomerization, in particular in $C"_{20}$ and in $C"_{14}$.

EXAMPLE 1

ANTI-LOSS SHAMPOO (for frequent use)

- Sodium lauryl ether sulfate		7 g
- Hydroxyethyl cellulose		2 g
- Clindamycin		0.4 g
- Octopirox		0.5 g
- α-bisabolol		0.75 g
- Butylhydroxy toluene (BHT)		0.3 g
- Perfume		0.05 g
- Triethanolamine	*quantity sufficient for* pH = 6	
- H_2O	*quantity sufficient for*	100 g

EXAMPLE 2

SHAMPOO TO TREAT HAIR LOSS

- Non-ionic surfactant obtained by condensation of 3.5 moles of glycidol with a C_{11-14} α-diol following FR 2 091 516		12.5 g
- Linoleic ester of erythromycin		1 g
- Octopirox		0.5 g
- Hydrocortisone		0.5 g
- BHT		0.2 g
- H_2O	*quantity sufficient for*	100 g

EXAMPLE 3

ANTI-LOSS LOTION (non-rinse product)

- Clindamycin	0.5 g
- Ciclopirox	0.5 g
- Hydrocortisone	0.2 g
- Perfume	0.05 g
- Water/ethanol (70/30 v/v) *quantity sufficient for*	100 g

EXAMPLE 4

ANTI-LOSS FOAMY GEL

- Lauryl ether sulfate of triethanolamine		8 g
- Carbopol		2 g
- Sodium chloride		2 g
- Glycerol		3 g
- Glycyrrhetinic acid		1.5 g
- Octopirox		0.8 g
- Retinic a11 trans ester of erythromycin		0.05 g
- BHT		0.3 g
- H_2O	*quantity sufficient for*	100g

EXAMPLE 5

ANTI-LOSS CAPILLARY SPRAY

- Ethanol		20 g
- Xanthane gum sold under the tradename Keltrol by the firm Kelco		2 g
- Octopirox		0.5 g
- BHT		0.2 g
- Perfume		0.05 g
- H_2O	*quantity sufficient for*	100 g

This composition is put into a classical aerosol device with 6 g of a propellant consisting of a mixture of FREON 12 and 114 (40/60).

CLAIMS

1. Composition intended to be utilized for treatment of hair, in particular to diminish its loss, characterized by the fact that it contains, in a medium suitable for topical application, at least one compound that corresponds to the formula:

see original (I)

where:

R_1 denotes a hydrogen atom, a linear or branched alkyl group, having 1 to 17 carbon atoms, cycloalkyl having 5 to 8 carbon atoms, cycloalkyl-alkylene, in which the alkylene group has 1 to 4 carbon atoms, aryl, aralkyl, in which the alkyl group has 1 to 4 carbon atoms, arylalkenyl group in which the alkenyl group has 2 to 4 carbon atoms, the aryl groups being able to be substituted by an alkyl group having 1 to 4 carbon atoms or by an alkoxy group having 1 to 4 carbon atoms.

R_2 denotes hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, a halogen atom or a benzyl group.

R_3 denotes hydrogen, alkyl having 1 to 4 carbon atoms or phenyl, and

R_4 denotes hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, methoxymethyl or a halogen atom or a benzyl group such that the salts are cosmetically or pharmaceutically acceptable.

2. Composition according to claim 1 characterized by the fact that it contains the 1-hydroxy 4-methyl 6-(2,4,4-trimethylpentyl)-2-(1H)-pyridone and the 6-cyclohexyl 1-hydroxy 4-methyl 2-(1H)-pyridone.

3. Composition according to claim 1 or 2, characterized by the fact that it may or may not contain anti-inflammatory steroids.

4. Composition according to claim 3, characterized by the fact that the anti-inflammatory agents are selected from among hydrocortisone, indomethacin, glycyrrhetinic acid, 1'α-bisabolol, betamethasone, fluorinolone acetonide, desoxymethasone.

5. Composition according to any of claims 1 to 4, characterized by the fact that it also contains antibacterial agents selected from the macrolides and the pyranosides.

6. Composition according to claim 5, characterized by the fact that the macrolides are selected from erythromycin or its derivatives and that the pyranosides are selected from linomycin and clindamycin and their derivatives.

7. Composition according to any of claims 5 and 6, characterized by the fact that the erythromycin derivatives are selected the estolate, the ethyl carbonate, the ethyl succinate, the glucoheptonate, the lactobionate, the propionyl lauryl sulfate, the propionate, the stearate, the linoleate, the mono-anic esters, bi or tri-anics of erythromycin, that the derivatives of clindamycin are selected from the hydrochloride, the palmitate, the phosphate, and that the derivative of lincomycin is a hydrochloride.

8. Composition according to any of claims 5 to 7, characterized by the fact that the derivatives of erythromycin, of lincomycin and of clindamycin are selected from the esters of retinoic acid, a11 trans and cis-trans erythromycin A, lincomycin and clindamycin as well as pharmaceutical and cosmetically acceptable salts.

9. Composition according to any of claims 1 to 8, characterized by the fact that the pyridone derivatives are present in proportions between 0.01 and 5 wt % relative to the total weight of the composition.

10. Composition according to any of claims 5 to 9, characterized by the fact that the antibacterial agents are present in the proportion between 0.01 and 5 wt % and in particular from 0.01 and 3 wt %.

11. Composition according to any of claims 3,4 and 9, characterized by the fact that the anti-inflammatory agents are present in the proportion between 0.01 and 5 wt % for the hydrocortisone, the indomethacine and the 1'α-bisabolol, in proportions of the order of 0.001 and 0.02 wt % for the derivatives of betamethasone, fluorolinolone or desoxymethasone.

12. Composition according to any of claims 1 to 11, characterized by the fact that it is provided in the form of lotions, shampoos, mousses, creams, sticks, spray or baumes.

13. Composition according to any of claims 1 to 12, characterized by the fact that the medium suitable for topical application consists of water or a mixture of water and physiologically acceptable solvents.

14. Composition according to any of claims 1 to 13, characterized by the fact that the application medium also contain thickening agents, surface-active agents, preservatives, pH regulators, colorings, cationic, anionic, non-ionic or amphoteric polymers, perfumes and any other additive suitable for topical application.

15. Cosmetic treatment method for the hair, characterized by the fact that at least one composition such as defined in any of clams 1 to 14 is applied to the hair.

16. Utilization of composition such as defined in any of claims 1 to 14, for the preparation intended for pharmaceutical treatment of hair loss.